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# Spin-label study of the microtubule modifier effect on the aqueous-medium microviscosity of nonhardened and cold-hardened winter wheat seedlings

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## Abstract

The influence of the substances modifying the microtubule structure, colchicine and dimethyl sulfoxide (DMSO), on the aqueous-medium microviscosity of nonhardened and cold-hardened winter wheat seedlings has been studied with a spin label (1-oxyl-2,2,6,6-tetrameth-l-4-oxypiperidine). The correlation times Tc of rotational diffusion of the labels were found with values for the cold-hardened plants lower than those for the plants grown in optimal temperature conditions. In case of nonhardened tissues colchicine gives the slight increase and DMSO causes the slight decrease of rc values in comparison with data for control variant without any treatment. It was explained by opposite changes in plasma membrane permeability and/or hydration or dehydration of cytoskeleton under the treatments. However, these substances do not influence the aqueous medium microviscosity of cold-hardened seedlings. This fact indicates the essential change of the tubulin proteins under cold exposure. 